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THE WOMAN'S CLUB OF FALL RIVER

Report on Infant Mortality

From a Study made by the

Fall River District Nursing Association

1913-1914

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District Nursing Association of Fall River, Mass.

Infant Mortality in Fall River

A report upon a Survey of the Mortality among 832 Infants born in June, July and August, 1913, in the city of Fall River, Massachusetts.

The Munroe Press, 28 Bedford St., Fall River, Mass.
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Introduction

The study of infant mortality upon which the following tables are based, was undertaken by The District Nursing Association of Fall River at the request of the CIVIC DEPARTMENT OF THE WOMAN'S CLUB. It is understood that the aim of the Civic Department in financing this investigation was two-fold. The Department desired to give immediate assistance to the mothers of Fall River in saving their babies from disease and death by the practical method of increasing the force of district nurses for the summer of 1913. At the same time it desired through this increased force of nurses to obtain full and important information as to the amount and cause of infant death in Fall River; this information to be used as a basis for further attempts to reduce infant mortality by effective and economical methods.

The District Nursing Association reports that both of these efforts have been successful, and not only has the following information been gathered, but while collecting the facts the nurses have given much practical instruction to many anxious mothers of little babies in Fall River, who otherwise would not have had the benefit of expert advice.

Many thanks are due to the mothers of the babies under consideration, for without their cordial co-operation this investigation would have failed of its true intention. It is interesting to know that in many of the homes under supervision in 1913-1914, the findings of this investigation are awaited with eagerness.

The blanks upon which the acquired information was transcribed, were prepared by the Russell Sage Foundation.

The tables and the greater part of the other statistical information here submitted, were prepared from the facts upon these Survey Cards by Dr. Louis Dublin, Chief Statistician for the Metropolitan Life Insurance Company of New York City.

Amount of Infant Death in Fall River

This investigation covers the history of 832 infants, born in Fall River during a period of three months—June, July, and August, 1913. These cases were not all registered at birth, and a thorough method of canvassing by the nurses had to be employed in order to locate all of the babies born during the three months under discussion. Some of the infants who died very young were not known to have existed until their death certificates were examined, as their deaths but not their births had been registered, so they could not be observed during their life time. It is evident that in 1913 a good many persons attending births were not reporting them according to the law, and the difficulty of studying infant mortality in a community where the birth registration is imperfect is again clearly shown.

All babies were visited from time to time as their needs required, and a record was made of the findings at each visit.

This record covered the condition of the baby, that of the mother, the mode of feeding, housing conditions, medical attendance, and other items of interest. A final visit was made on the anniversary of each birth, at which time the exact condition of the baby was carefully ascertained.

Of the 832 births, 30 were recorded as still-births. One hundred and fifty-one additional deaths are known to have occurred in the course of the year.

These tables, then, are based on 802 live births, 30 still-births, and 151 deaths.

If the 802 infants born alive had been kept under observation throughout the entire year, or until earlier death, the death rate of Fall River would have been 187 per 1000 live births. As a matter of fact, 116 infants were either never found, left the city before the close of the year, or were lost sight of as their families moved from one section of the city to another. The difficulty of keeping 802 infants under observation, when over a quarter of these change their residence at least once during their first year of life, is easily understood, but the great majority of the 116 infants, probably alive but not visited on their first birthday, are known to have left town. Some are settled on farms in the nearby country villages, while some have gone to the Azores, and some even as far away as Austrian Poland.

It is evident that a great deal of the necessary baby welfare work in Fall River will benefit other cities. And as a good many of the children come here when infants in arms, it is equally evident that this city is not entirely responsible for all of the early deaths which occur. The work of the nurses was constantly hampered by the immigration of more babies from portions of the earth where the loss of infant life is a less regarded matter.

From a statistical point of view, 116 infants were lost from observation during the year. Of this number, 22 were either never found on account of faulty birth registration, or were under observation less than a week, 28 less than a month, and 106 less than four months. The death rate of 187 per 1000 is therefore possibly an underestimate, since some of the 116 infants may have died outside Fall River.

These tables show the annual death rate constructed by summing up the four quarterly death rates, correcting the denominator at each period for departure of infants from observation. The four quarterly rates are 131.8, 15.1, 36.4, and 19.0, respectively. On this basis, necessarily inexact, the annual death rate would be 202.3. It should be remembered that this rate of 202.3 per 1000 live born is for infants born during the three summer months of June, July and August. This death rate must not be considered as identical with the annual city death rate for 1913 which is lower than this figure.

Still-Births

Concerning still-births, Dr. Dublin finds as follows:

"There were 30 still-births in this series of 832 births—a rate of 36.0 per 1000 births. This rate compares favorably with other cities. The number of still-births per 1000 born, as recorded for Johnstown, Pennsylvania, in the recent study for the Children's Bureau, was 56.7 for the year 1911; that for the city of New York for the year 1912 was 46.5; and that in a series of 10,000 cases born in Sloane hospital was 44 per 1000. It may be noted that 21 of these still-born children were delivered by physicians and 6 by midwives; the still-birth rate was then 40 per 1000 for the former group and only 23 per 1000 for the latter. Six or 20 per cent of the still-born were premature."

It may not be irrelevant in this connection to state that our record cards show a far greater loss of infant life from miscarriage than from still-birth.

Age at Death

The following table gives the number and percentage of deaths and the rate per 1000 live births; for each period of life.

TABLE I

Infant deaths, percentage of total, and death rate by period of life

Period of Life	Number	Per Cent of Total	Deaths Rate per 1000 Births
1st year	151	100.0	202.3
1st day	25	16.6	31.2
1st week	37	24.5	47.4
1st month	62	41.1	79.7
1st quarter	102	67.5	131.8
2nd quarter	11	7.3	15.1
3rd quarter	25	16.6	36.4
4th quarter	13	8.6	19.0

The greater part of the mortality evidently occurred during the first few weeks of life. The percentage of all deaths occurring during the first quarter of the year, 67.5, is higher than that found by the Children's Bureau for Johnstown, where the figure was 55.1. The death rate for the first quarter is also much higher than that recorded by Mr. Verrill in his findings on Fall River infant mortality for 1908. He found the excessive amount of infant deaths after the first quarter of the year. We do not. Evidently the great pains taken to instruct the mothers in baby care, which the district nurses took both before and during the survey, has had its effect, as the deaths among older babies have decreased greatly since Verrill's investigation.

Of course the elements entering into the deaths of the younger infants cannot be so readily controlled by instruction to mothers after the birth of the child; as our findings again confirm. For example, a considerable number of the infants under observation were evidently born with serious physical defects, which resulted in death during the period soon after birth.

Causes of Death

TABLE II

Number and percentage of deaths, age at death, and cause of death

Cause of Death		Deaths								
	NAME	1st year	No. per cent of total	1st day	1st week	1st month	1st quarter	2nd quarter	3rd quarter	4th quarter
	All Causes	151	100·0	25	37	62	102	11	25	13
*104	Diarrhea and enteritis	50	33·1		1	13	42	2	2	4
151	Congenital debility, icterus and sclerema	31	20·5	13	17	24	28	2	1	
	(1) Premature births	17	11·3	12	16	17	17			
	(2) Congenital debility	14	9·3	1	1	7	11	2	1	
91	Broncho pneumonia	16	10·6					4	6	6
152	Other causes peculiar to early infancy	15	9·9	8	15	15	15			
	(1) Accidents of labor	8	5·3	3	8	8	8			
	(2) Other causes	7	4·6	5	7	7	7			
92	Pneumonia (including lobar)	8	5·3				2		6	
150	Congenital malformations	8	5·3	4	4	7	7	1		
	(2) Congenital malformations of the heart	6	4·0	3	3	5	5	1		
	(3) Other congenital malformations	2	1·3	1	1	2	2			
8	Whooping cough	7	4·6				3		4	
89	Acute bronchitis	6	4·0			1	2	1	2	1
28	Pulmonary tuberculosis	2	1·3						1	1
	All other causes	8	5·3		0	2	3	1	3	1

*International list number

Under "Still Birth" we have seen that 30 of our considered infants were still born. We find that 46 deaths of the 62 which occurred in the first month are traceable to causes which point directly to bad conditions before birth or during the confinement. We find in fact that over half of our infants in Fall River who do not live to be a year old are lost from birth or prenatal causes, according to the death certificates.

There were 50 deaths, which is about one-third of all the deaths of live infants, attributed to diarrhea and enteritis. Upon analysis it was found that 43 per cent of these infants were entirely breast fed from birth to death, and the majority of the others were fed on breast milk supplemented with cow's milk modified according to physician's formula, either because the infant was ten months old or because the delicate health of the mother caused an inadequate supply of breast milk early in the year.

Therefore, it would seem that the causes of many of these early deaths registered as due to enteritis and diarrhea had little to do with the question of a choice of feeding but were probably due to the same causes which led to the early death of so many of the other infants under discussion. As additional confirmation, 13 of these 50 deaths occurred during the first month of life, and 29 during the second and third month, leaving only 8 to take place during the last three quarters of the year. As supervised children of healthy mothers were rarely weaned until after their third month of life, it is evident that either these infants who died were not born of healthy mothers or evident that they were not weaned during those early months when deaths from diarrhea and enteritis were most prevalent. It obviously cannot be the changing diet which was responsible for so many deaths from diarrhea and enteritis as when this occurred early in the year it merely followed diseased parental conditions as a matter of course, and was a significant consequence of bad home conditions, not a cause of death. In order to prevent our infant death from diarrhea and enteritis, an improvement in home conditions leading to the physical exhaustion of the mother after child birth, must take place, that the child may inherit a good constitution and be fed on breast milk by a healthy mother until he is passed the danger period of early infancy.

As far as climatic conditions are concerned we may say that we could not find that the infants born in June died any earlier or later or more frequently than did the infants born in July or August, neither did they die of different causes. We do not assume that this would be true for the other nine months of the year, nor do we assume that it would not.

Dr. Dublin finds as follows concerning the causes of death not previously discussed: "Of the 31 deaths under the title "Congenital Debility, Icterus, and Sclerema", 17 were stated as "premature births" with no further qualifications. Eight additional premature births were reported in conjunction with other causes of death and preference was given to the more definite statement. Thus three additional deaths were due to atalectasis and two more were ascribed to "accidents of labor". These five cases appear in this table under the title "152 of the International List, other causes peculiar to early infancy". Of the three remaining premature births, 2 cases are assigned to "congenital debility" and one case to "diarrhea and enteritis". There were therefore 25 deaths of prematurely born children in the total of 151 deaths, or 16.6 per cent; this is an extraordinarily high proportion. The respiratory diseases comprise 16 cases of broncho-pneumonia, 8 cases of unqualified or lobar pneumonia, and 6 cases of acute bronchitis, a total of 30 cases. Of this number only 9 occurred in the first half year of life, and 21 in the second half year. The acute infections are represented by whooping cough to the number of 7 cases and by diphtheria in 1 case. There were 2 cases of pulmonary tuberculosis, and 7 other cases due to as many different causes."

Though 16.6 per cent is a very high proportion of death to be ascribed to prematurity, it is not to be considered as comprising all the premature births which were followed by death within one year. Twenty-five deaths are ascribed as due in whole or in part to prematurity, but 8 more of the deaths followed premature birth, within the year, though prematurity is not included as a cause of death on the death certificate. In considering the effect of premature birth in the community, it seems well to recognize that at least 21.8 per cent of the deaths here classified were of infants born prematurely.

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Feeding of Infants

TABLE III

Number alive at time stated, number of deaths during remainder of year and death rate by mode of feeding

Mode of Feeding at Time Stated	Number alive at time stated	Number of deaths during remainder of year	Rate per 1000 living
Beginning of 2nd week: Total	649	114	175.7
(*a*) Breast feeding	565	74	131.0
(*b*) Artificial and mixed feeding	76	32	421.1
(*c*) Unknown	8	8	
Beginning of 2nd month: Total	624	89	142.6
(*a*) Breast feeding	514	52	101.2
(*b*) Artificial and mixed feeding	105	32	304.8
(*c*) Unknown	5	5	
Beginning of the 4th month: Total	584	49	83.9
(*a*) Breast feeding	405	26	64.2
(*b*) Artificial and mixed feeding	178	22	123.6
(*c*) Unknown	1	1	
Beginning of the 7th month: Total	573	38	66.3
(*a*) Breast feeding	368	18	48.9
(*b*) Artificial and mixed feeding	205	20	97.6
Beginning of the 10th month: Total	548	13	23.7
(*a*) Breast feeding	335	7	20.9
(*b*) Artificial and mixed feeding	213	6	28.2

This table divides all infant feeding into but two classes, those infants who were entirely breast fed, and those who were fed on any sort of artificial food at all, either alone or to supplement breast feeding. According to our record cards, there was but little bad feeding of the babies born in Fall River in the summer of 1913, probably because each birth was kept under supervision to a great extent and any tendency to give wrong food was observed and corrected under medical advice. Most of the artificial food mentioned in this table was cow's milk modified according to formula, and very seldom in the first three months was this given in any way except to supplement breast feeding. Naturally, since the infants were fed on artificial food only because their more or less delicate mothers were unable to supply sufficient breast milk, artificially fed infants were the least robust, they had the poorest inheritance. It is not surprising to find that according to this table they died in larger proportion than did those infants whose mothers were sufficiently robust to feed them on the breast for 6 or 8 months or more. It may be added, however, that these artificially fed infants died, according to their death certificates, quite as often from diseases of the respiratory organs, etc., as from diseases of the digestive organs.

It is noteworthy that of the 535 children who survived the year, and were personally observed at a year old by the visiting nurses, 350 or 65.4 per cent were breast fed entirely for at least six months, while 328 were breast fed entirely for at least 9 months. This is a very large proportion of babies to be fed entirely on the breast for so long a period, and the nurses whose persuasions and advice were so often needed and used to accomplish this result feel proud of their success. It was a great temptation to many of the mothers to supplement their breast feedings by a daily bottle of milk as the babies grew older and the burden of regular hours in the house and wholesome and restricted diet grew irksome. But it seems worth while to continue breast feeding at all sacrifices where the health of the mother permits.

The following situation should also be at least considered. We find a number of our mothers pregnant again within a few months after the birth of these infants under discussion. Some of these new infants were born alive in poor condition, while others miscarried after about six months.

Others were born in moderately good condition. We found these latter to be infants whose mothers abandoned the breast feeding of the infants here considered, very early in the year, in order to conserve their vitality for the new comer. We also found that all of these pregnant mothers abandoned breast feeding under six months from the time of birth; therefore, renewed pregnancy is, among our group of mothers here considered, closely connected with the abandonment of breast feeding early in life.

At the close of the year, 489 infants were found in good condition, 19 in fair condition, and 27 in poor condition. Of the 27, 17 were breast fed less than six months, and 13 less than three months. It may be added that 11 of these 27 were having whooping cough from which they did not all recover. Another died shortly after his first birthday of meningitis, and another of tuberculosis. It is significant that a number of these 27 infants found in poor condition at a year old were illegitimate.

On the whole it is fair to deduce that breast feeding is common in Fall River and that the reasons for abandoning breast feeding early in the year are usually ill health. Naturally the mothers of illegitimate infants, the wives deserted during pregnancy, and the widows, were faced by the question of self support, and some of these early artificial feedings are consequent upon this pathetic situation. That death in such homes should be frequent is to be expected.

Attendance at Delivery

TABLE IV

Number of births, number of years exposed, number of deaths and death rate by attendant at birth

Attendant at Birth	Number of births	Number of years exposed	Number of deaths	Rate per 1000
All forms of attendance.....	802	746	151	202
Physician	507	483	96	199
Midwife.....	254	239	45	188
Other and Unknown.....	41	24	10	

Evidently children born with physicans in attendance did, according to this table, exhibit a higher mortality rate than those born under the care of midwives. This same inference was also drawn after a consideration of our still-births. A considerable proportion, 49 per cent, of the deaths among the children born under the care of physicians occurred during the first month of life; the corresponding figure for those born with midwives was only 27 per cent. The results are given as obtained. They should not lead to the inference that midwifery is more desirable than good professional attendance. Many reasons undoubtedly contributed to this finding but it is not within the scope of this paper to attempt their analysis.

It is interesting to know that for these infants under discussion the choice of a midwife at birth is largely racial. The French Canadian women either native or foreign born, practically never employed a midwife, while the majority of the Poles and the Portuguese seemed to prefer her services to those of a doctor. She is also used by the English women, to a surprising extent. Her services are not confined to women of foreign birth.

"Other and Unknown" include any other infants born with no attendance at all. Such births, though few, were accompanied by a heavy mortality. The maternity wards at the local hospitals, to which patients are admitted free of charge, were at no time fully occupied during the period when these confinements took place.

Again we see unfortunate ignorance of the resources of modern civilization to be a cause of infant death in our community.

Age of Mother

TABLE V

Number of births, number of years exposed, number of deaths, and death rate by age of mother

Age of Mother	Number of births	Number of years exposed	Number of deaths	Rate per 1000
All ages	802	746	151	202.4
Under 20	33	29	3	103.4
20-29	408	386	73	189.1
30-39	267	257	53	206.2
40 and over	37	36	8	222.2
Unknown	57	38	14	

"The lowest death rate occurred among infants of mothers whose age was 20 and under; but this figure is hardly trustworthy in view of the small number of cases under observation. From age 20 onward, the mortality increased regularly with the age of the mother, the highest rate being among infants of mothers at ages 40 and over." (Dublin)

It may be suspected that the wisdom of the mother did not increase with age, and this was found true in most cases on the record cards, the younger mothers being by far the most willing to learn and generally the least in need of instruction. Late marriages were however rather frequent, and the size of the family can by no means be determined by the age of the mother at the births here recorded. One death was that of a Polish baby whose mother was bearing her first child at forty.

Nativity of Mother

TABLE VI

Number of births, number of years exposed, number of deaths, death rate by nativity of mother

Nativity of Mother	Number of births	Number of years exposed	Number of deaths	Rate per 1000 births
All countries	802	746	151	202.4
United States	253	242	37	152.9
Portugal and Azores	182	174	52	298.9
Canada	151	145	25	172.4
All other countries	216	185	37	200.0

"The mortality of infants of foreign born mothers has been shown to be considerably higher than that of infants of native born mothers in a number of American communities, including New York City, Boston, and Johnstown. This table for Fall River confirms these findings." (Dublin)

It is interesting to know that though only a comparatively few infants were found with all four grandparents born in the United States, yet the mortality among this small class of infants was exceedingly high, greater than among the foreign born women's children.

The death rate of the Portuguese infants is unfortunately large, 298.9 per 1000. Sixty per cent of the deaths occurred among infants under three months old. It may be seen by reference to the record cards that a great many of these 52 Portuguese infants who died, were born in poor condition, and that the majority had mothers who were themselves in poor condition if not actually sick. The most notable excess of death was from diseases of the respiratory organs, though the Portuguese infants have also far more than their proportion of deaths following premature birth.

Where the question of the birthplace of the mother or the question of nationality is considered, it may be well to mention that about thirteen per cent of our infants are born of mixed marriages, and that a fair proportion of our immigrant mothers married men who were born in the United States. This table of course gives merely the nationality and birthplace of the mother.

The inclusion "all others" for which the rate was 200 per 1000, embraces 13 countries.

Occupation of Mother During Pregnancy

TABLE VII

Number of births, number of years exposed, number of deaths, and death rate by occupation of mother

Occupation of Mother	Number of births	Number of years exposed	Number of deaths	Rate per 1000 births
All occupations	802	746	~~39~~ 151	202.4
Housekeepers, not gainfully employed	601	567	91	160.5
* Housekeepers, gainfully employed	107	67	39	592.0
* Gainfully employed, not housekeepers	68	101	12	118.8
Unknown	26	11	9	

In this table women gainfully employed during pregnancy are divided into two classes. One class consists of women who tried to keep house, bring up children, and work for wages outside the home at the same time. The other class consists of married women expecting their first children, who were either boarding or doing light housekeeping for themselves and their husbands. The infants of the first class of women show a very high death rate. The infants of the second class of women show a far lower death rate. Therefore gainful employment seems not in itself a factor in the infant mortality of the births here considered. Infants of women with no labor except that of regular, gainful employment at stated hours outside their homes have a reasonably low mortality. The mortality of the infants whose mothers are not wage earners but workers in their own homes does not seem to be unreasonably high on account of the housework. But women who try to combine these two employments are a serious menace to the death rate of the community, with an infant mortality of 592.0 per 1000 births. Fortunately the number of women who thus imperil their children's lives is not large, being 13.3 per cent of the total number of live births here considered.

According to our record cards, women who were forced from economic necessity to be both wage earners and housekeepers during pregnancy, were few.

Out of the 39 deaths recorded of infants whose mothers were gainfully employed housekeepers, just 7 deaths occurred in homes where the need of gainful employment was at all obvious. These 7 infants divide themselves into four classes, which are from an economic point of view a handicap to the community. Infants of widows without means of support, illegitimate infants, infants of wives deserted during pregnancy, and infants of fathers whose wages will not support their particular families in good health. In any of these four classes infant death is apt to occur. That only 7 of our employed mothers here considered in reference to the 39 deaths, belong to this class, shows that the employed pregnant mother was far from an economic necessity in the 802 families under consideration. As further proof, it was found, by the record cards, that only 5 of the 39 deaths of infants whose mothers were gainfully employed housekeepers, occurred in homes where there were more than two children, while one of those 5 homes contained a mother whose habitual drunken fits of cruelty actually caused the death of her baby.

Again it would seem that the high death rate of our infants can be lowered, and can be lowered only, by the improvement of home standards in the community.

* In preparing this table Dr. Dublin did not divide his gainfully employed women, but in view of the local interest in this subject we thought it wise to be as explicit as our data permitted.

Occupation of the Father

TABLE VIII

Number of births, number of years exposed, number of deaths, and death rate by occupation of father

Occupation of Father	Number of births	Number of years exposed	Number of deaths	Rate per 1000 births
All occupations	802	746	151	202.4
Textile occupations	360	342	69	201.8
Other occupations	400	379	70	184.7
Unknown	42	25	12	

There is a difference of 17 per 1000 in favor of the infants of non-textile workers. Considering that textile workers are indoor workers and include the least skilled labor in the city and that non-textile workers who form the class of those of "other occupations" comprise all outdoor laborers and all of the most highly educated classes in the community, this difference seems very slight. In view of a possible comparison of this table with the preceding one, it may be wise to add that many of the pregnant women engaged in gainful employment outside the home were not wives of textile workers, and that where they were, the record cards show only three families with more than two children in the home.

Conclusion

As far as is known, this investigation here tabulated is the only one in existence which was conducted contemporaneously with the life history of the infants considered. The conclusions of an investigation made while impressions were fresh, and objective confirmation was available, should be of unusual value. The disadvantage of such a study lies in the fact that no other similar studies are available for comparison. We can therefore only state that the death rate of the infants here considered is very large, that the problem of infant feeding in this connection is a minor one, and that the excessive death rate seems to be due to deep seated and perplexing sociological causes which are very difficult to remedy in a constantly renewed immigrant population.

Special information on any subject touched upon in the survey, which is not here fully presented, will be furnished upon application should it be desired. The mass of information collected is not in any way contradictory, but it seemed best not to complicate the report with less essential details.

A city like Fall River has its peculiar burden clearly reflected by its abnormal death rate and by the results of an investigation like the foregoing. It must welcome the most ignorant immigrant types because it affords work which they are able to accomplish. With this welcome there inevitably results the duty of conversion to standards of American citizenship, and this means, first, last, and all the time, education; not only in that which is taught in the schools, but in social standards, methods of living, proper attention to health and the care of the children.

This is what the District Nursing Association, or the Instructive Nursing Association if you like, is endeavoring to do through its visiting nurses, its conferences, and its settlement work.

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